

CLAIMS:

1. A method for adjusting the gain of a Low Noise Amplifier (LNA) in an RF unit that includes the LNA, a mixer coupled to the output of the LNA, a Band Pass Filter (BPF) coupled to the output of the mixer, a first received signal strength indicator (RSSI_A) coupled to
5 measure the wideband signal strength at the output of the mixer, and a second received signal strength indicator (RSSI_B) coupled to measure the narrowband signal strength after the BPF, the method comprising:

determining that a signal of interest is not present in a received RF signal present at an input of the LNA;

10 measuring wideband signal strength at the output of the mixer (RSSI_A);

measuring narrowband signal strength after the BPF (RSSI_B);

determining that intermodulation interference exists; and

15 adjusting the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly.

2. The method of claim 1, wherein determining that intermodulation interference exists comprises:

adjusting the LNA gain by a gain adjustment step;

measuring again narrowband signal strength after the BPF (RSSI_B'); and

20 determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step, such determination indicating the presence of intermodulation interference.

3. The method of claim 2, wherein determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step is determined by comparing the difference between RSSI_B and RSSI_B' to a threshold that is based upon the LNA gain.

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4. The method of claim 1, further comprising not adjusting the LNA gain when RSSI_A is less than a predefined threshold (THRS_B).

5. The method of claim 1, wherein determining that intermodulation interference exists is performed only when RSSI_A is greater than a predefined threshold (THRS_B).

6. The method of claim 1, further comprising reducing the LNA gain when RSSI_A exceeds a predefined threshold (THRS_A).

7. A method for adjusting the gain of a Low Noise Amplifier (LNA) in an RF unit that includes the LNA, a mixer coupled to the output of the LNA, a Band Pass Filter (BPF) coupled to the output of the mixer, a first received signal strength indicator (RSSI_A) coupled to measure the wideband signal strength at the output of the mixer, and a second received signal strength indicator (RSSI_B) coupled to measure the narrowband signal strength after the BPF, the method comprising:

determining that a signal of interest is not present in a received RF signal present at an input of the LNA;

measuring wideband signal strength at the output of the mixer (RSSI_A);

measuring narrowband signal strength after the BPF (RSSI_B);

adjusting a gain (the LNA gain) of the LNA;

determining that intermodulation interference exists by:

adjusting the LNA gain by a gain adjustment step;

measuring again a signal strength after the BPF (RSSI_B'); and

determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step; and

adjusting the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly.

8. The method of claim 7, wherein determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step is determined by comparing the difference between RSSI_B and RSSI_B' to a threshold that is based upon the LNA gain.

12. A Radio Frequency unit comprising:

a transmit/receive block that couples to an antenna;

transmit circuitry that receives Intermediate Frequency (IF) transmit data from a host device, that converts the IF transmit data to an RF transmit signal and that couples the RF transmit signal to the transmit/receive block for transmission;

a Low Noise Amplifier (LNA) operably coupled to the transmit/receive block to receive an RF receive signal;

a mixer coupled to receive an output of the LNA;

a Band Pass Filter (BPF) coupled to an output of the mixer;

a first received signal strength indicator coupled to the output of the mixer that indicates a wideband received signal strength (RSSI_A);

a second received signal strength indicator coupled after the BPF that indicates a narrowband received signal strength (RSSI_B); and

an LNA gain adjustment block that operates to:

determine that intermodulation interference exists; and

adjusts the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly.

13. The Radio Frequency unit of claim 12, wherein in determining that intermodulation interference exists comprises, the LNA gain adjustment block:

records RSSI_B;

adjusts the LNA gain by a gain adjustment step;

records a new RSSI_B (RSSI_B'); and

determines that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step, such determination indicating the presence of intermodulation interference.

14. The Radio Frequency unit of claim 13, wherein in determining that intermodulation interference exists, the LNA gain adjustment block compares the difference between RSSI_B and RSSI_B' to a threshold that is based upon the LNA gain.

15. The Radio Frequency unit of claim 12, wherein the LNA gain adjustment block does not adjust the LNA gain when RSSI_A is less than a predefined threshold (THRS_B).

16. The Radio Frequency unit of claim 12, wherein the LNA gain adjustment block reduces the LNA gain when RSSI_A exceeds a predefined threshold (THRS_A).

17. A Radio Frequency unit comprising:

a transmit/receive block coupled to an antenna;

transmit circuitry that receives Intermediate Frequency (IF) transmit data from a host device, that converts the IF transmit data to an RF transmit signal and that couples the RF transmit signal to the transmit/receive block for transmission;

a Low Noise Amplifier (LNA) operably coupled to the transmit/receive block to receive an RF receive signal;

a mixer coupled to receive an output of the LNA;

a Band Pass Filter (BPF) coupled to an output of the mixer;

a first received signal strength indicator coupled to the output of the mixer that indicates a wideband signal strength (RSSI_A);

a second received signal strength indicator coupled after the BPF that indicates a narrowband signal strength (RSSI_B); and

an LNA gain adjustment block that operates to:

record RSSI_B;

adjust the LNA gain by a gain adjustment step;

record a new RSSI_B (RSSI_B'); and

determine that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step, such determination indicating the presence of intermodulation interference.

adjust the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly.

18. The Radio Frequency unit of claim 17, wherein in determining that intermodulation interference exists, the LNA gain adjustment block compares the difference between RSSI_B and RSSI_B' to a threshold that is based upon the LNA gain.

5 19. The Radio Frequency unit of claim 17, wherein the LNA gain adjustment block does not adjust the LNA gain when RSSI_A is less than a predefined threshold (THRS_B).

20. The Radio Frequency unit of claim 17, wherein the LNA gain adjustment block reduces the LNA gain when RSSI_A exceeds a predefined threshold (THRS_A).

21. A Radio Frequency unit comprising:

a transmit/receive block coupled to an antenna;

transmit circuitry that receives Intermediate Frequency (IF) transmit data from a host device, that converts the IF transmit data to an RF transmit signal and that couples the RF transmit signal to the transmit/receive block for transmission;

a Low Noise Amplifier (LNA) operably coupled to the transmit/receive block to receive an RF receive signal;

a mixer coupled to receive an output of the LNA;

a Band Pass Filter (BPF) coupled to an output of the mixer;

a first received signal strength indicator coupled to the output of the mixer that indicates a wideband received signal strength (RSSI_A); and

an LNA gain adjustment block that operates to:

determine that intermodulation interference exists based upon RSSI_A and a narrowband received signal strength (RSSI_B) received from a coupled baseband processor; and

adjust the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly.

22. The Radio Frequency unit of claim 21, wherein in determining that intermodulation interference exists comprises, the LNA gain adjustment block:

records RSSI_B;

adjusts the LNA gain by a gain adjustment step;

records a new RSSI_B (RSSI_B'); and

determines that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step, such determination indicating the presence of intermodulation interference.

23. The Radio Frequency unit of claim 22, wherein in determining that intermodulation interference exists the LNA gain adjustment block compares the difference between RSSI_B and RSSI_B' to a threshold that is based upon the LNA gain.

24. The Radio Frequency unit of claim 21, wherein the LNA gain adjustment block does not adjust the LNA gain when RSSI_A is less than a predefined threshold (THRS_B).

25. The Radio Frequency unit of claim 21, wherein the LNA gain adjustment block reduces the LNA gain when RSSI_A exceeds a predefined threshold (THRS_A).

26. A method for determining whether intermodulation interference exists in an RF unit that includes a Low Noise Amplifier (LNA), a mixer coupled to the output of the LNA, and a Band Pass Filter (BPF) coupled to the output of the mixer, the method comprising:

measuring narrowband signal strength after the BPF (RSSI_B);

adjusting the LNA gain by a gain adjustment step;

measuring again a signal strength after the BPF (RSSI_B'); and

determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step.

27. The method of claim 26, wherein determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step is determined by comparing the difference between RSSI_B and RSSI_B' to a threshold that is based upon the LNA gain.

28. The method of claim 27, further comprising not adjusting the LNA gain when RSSI_A is less than a predefined threshold (THRS_B).